



Kirby Morgan Dive Systems, Inc.®

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Part #525-309 Regulator Rebuild Kit for SuperFlow® and SuperFlow® 350 Regulators

Part Number	Description	Qty
510-011	O-ring	1
510-014	O-ring	1
510-552	Exhaust Valve	1
510-553	Diaphragm	1
520-032	Washer	1
530-303	Nut	1
530-506	Washer	1
530-601	Retaining Pin	1
535-807	Spring Set	1
545-026	Inlet Valve	1
535-804	Spring	1
530-505	Washer	1

Tools Required

- Regulator Tool Kit, P/N 525-620
- Torque Wrench
3/4", 1 1/16", 7/8", 1 3/16" Attachments
- Torque Screwdriver
1/4" Flat Blade Attachment
- 7/8" Open End Wrench
- Small Ball Peen Hammer
- 1 1/4" Socket (SuperFlow®)
1 3/8" Socket (SuperFlow® 350)
- or Socket Wrench Regulator Mount Nut, P/N 525-625 (in Regulator Tool Kit)
- 3/8" Drive extension -minimum 3" in length
- 3/32" Punch & Small Block of Wood
- < 50% O₂ gas mix use Molykote® 111 or equivalent
> 50% O₂ gas mix use Christo-Lube® or equivalent

Disassembly Procedure

Remove the regulator from the mask or helmet and disassemble following the procedures in either the SuperFlow® or SuperFlow® 350 module. Clean all metal parts by soaking in a 50% solution of white vinegar and fresh water, or a sonic cleaner may be used. Rinse and blow off or air dry. Inspect all parts carefully. Replace any that are worn or damaged as well as all that are supplied in the repair kit.



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Assembly Procedure

1. Install the new exhaust valve into the regulator and trim off excess stem.
2. Place the new spring and the brass washer onto the inlet valve. If the regulator is a SuperFlow® 350, the washer and spring are not used. Use the castle wrench P/N 525-618 from the tool kit, P/N 525-620 to insert the inlet valve into the inlet mount tube in the regulator body as shown in the blow-apart drawing.
3. Push in on the castle wrench, so the stem extends into the interior of the regulator body. Place the washer and the spacer over the end of the inlet valve stem. (The washer and spacer may be placed in the recess in the regulator body before inserting the inlet valve).



4. Place the new nut into the socket of the socket wrench from the regulator tool kit and insert it through the adjustment shaft tube. With the inlet valve depressed, run the nut onto the inlet valve stem about two turns, leaving enough slack to allow installation of the lever with the inlet valve depressed the washer and spacer should be loose on the inlet valve stem.



5. The lever arm assembly is installed next. The lever legs **MUST** be parallel to each other. Check them with a straight edge and true if necessary by carefully bending with pliers. Now, with the inlet valve depressed insert the lever legs between the washer and spacer.



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6. Use the castle wrench or the inlet valve holder from the regulator tool kit to hold the inlet valve stationary. Now tighten the nut until two threads are visible past the nut.

7. While holding the lever down, install the inlet nipple with its O-ring into the regulator body. Tighten inlet nipple to 40 inch pounds (4.5 Nm).



Inspect the inside of the adjustment tube on the regulator body to be sure there is no corrosion and the adjustment assembly can travel freely. Ensure the alignment tube is not bent or misaligned from impact, and that the threads are clean. Replace the adjustment shaft and O-ring if any damage is found.

8. Lightly lubricate the piston and spacer. Install the piston, spring set and spacer into the adjustment tube of the regulator body as shown in the BlowApart drawing.
9. Next slide the washer and O-ring onto the adjustment shaft of the adjustment knob assembly.
10. Slide the packing nut onto the adjustment shaft, then slip the knob onto the end of the shaft. Hold the shaft and rotate the knob until the pin holes line up. Use the inlet valve holder from the Regulator Tool Kit to accurately align these holes.



11. Install the retaining pin by tapping it in with a light hammer until it is flush.

12. Lubricate the threads lightly, then thread the adjustment shaft into the tube until the packing



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nut can be started. Tighten the packing nut to 40 inch pounds (4.5 Nm). Make sure that the adjustment knob is run in simultaneously.

13. Check the adjustment knob for free rotation.
14. Stretch the exhaust whisker onto the exhaust flange of the regulator. Secure with tie wrap.
15. Mount the regulator to the mask or helmet. Install the sealing O-ring and regulator mount nut. Thread the regulator mount nut only hand tight. **DO NOT FULLY TIGHTEN THE NUT AT THIS TIME.**
16. Lightly lubricate the bent tube O-ring and push the O-ring end of the bent tube assembly into the inlet nipple on the regulator. Slide it in until the side block end is aligned with the threads for the mount nut
17. Be sure the Teflon® O-ring is in place on the side block end of the bent tube, then engage the threads to the side block and hand tighten.
18. Start the "regulator to bent tube" mount nut onto the inlet nipple and run it up by hand as far as it will go.



NOTE

Run the mount nut up on the inlet nipple **HAND TIGHT ONLY.**

19. Using a torque wrench, tighten the bent tube assembly nut onto the side block to 100 inch pounds (11.3 Nm). Always reference "Torque Specs" starting on page TORQ-1 in our modular manual to confirm current correct torque.
20. Make certain the regulator end of the bent tube is threaded onto the regulator, by lightly applying torque. When a small amount of resistance is felt, lock it into place with the jam nut.



21. Hold the hex on the bent tube with a wrench and tighten the jam nut against it with a torque wrench to 40 inch pounds (4.5 Nm). Always reference "Torque Specs" starting on page TORQ-1 in our modular manual to confirm current correct torque.

22. Use a torque wrench inside the helmet with a 1 3/8" socket (regulator mount tool P/N 525-625 found in the KMDSI tool kit P/N 525-363) and extension to tighten the regulator mount nut to 100 inch pounds (11.3 Nm). Always reference "Torque Specs" starting on page TORQ-1 in our modular manual to confirm current correct torque.

23. Attach the whisker to each side of the face port retainer using the screws, zinc anodes or





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kidney plates with spacers. Using a torque wrench with a flat blade screwdriver adapter, carefully torque these screws to 12 inch pounds (1.3 Nm). Always reference "Torque Specs" starting on page TORQ-1 in our modular manual to confirm current correct torque.

Regulator Testing



NOTE

If there is little (less than $\frac{1}{16}$ inch / 1.5 mm) or no lever play, the regulator will free flow. If there is too much free play, (more than $\frac{1}{8}$ inch / 3.0 mm) the regulator will not be capable of full demand flow potential.

1. Remove the regulator clamp, cover and diaphragm.
2. Rotate the adjustment knob (clockwise) all the way in, towards the regulator body.
3. Pressurize the regulator to between 135-150 p.s.i.g (9-10 bar) of supply pressure.
4. Rotate the adjustment knob out (counterclockwise) until the regulator starts to free flow, then rotate the adjustment knob in (clockwise) until the free-flow just stops.

Depress the lever several times to ensure the free-flow has stopped. If the free flow does not stop, the lock nut is too tight. If the roller lever is sloppy (loose) the lock nut is too loose.

Important Notes on Regulator Adjustment

1. If a new inlet valve or soft seat has been installed, turn the adjustment knob all the way in and allow the regulator to sit for 24 hours. This will allow the soft seat in the inlet valve stem to take a set against the inlet nipple.

If the regulator is to be used immediately, be aware that the rubber seat will take a set, changing the adjustment and performance of the regulator. **Readjustment of the regulator will be required after the first day of use.**

2. Normally, if the regulator free flows, the lock nut is too tight, and must be loosened until the lever has between $\frac{1}{16}$ inch to $\frac{1}{8}$ inch (1.5-3.0 mm) of free play at the end.
3. If the regulator continues to free flow after proper adjustment using the correct supply pressure of 135-150 p.s.i.g. (9-10 bar), both the inlet valve soft seat and the inlet nipple must be inspected for damage. Generally, if the inlet nipple has missing chrome or a bent or damaged sealing edge, the soft seat may not make a proper seal and may also be damaged. Replacement of both the inlet nipple and the soft seat is strongly recommended under these conditions.

Regulator Adjustments with the Supply Pressure

1. Insert the inlet valve holding tool into the balance hole on the inlet tube. Push forward on the tool to stop the inlet valve stem from turning. Adjust the nut until the free flow just stops and there is $\frac{1}{16}$ inch (1.5 mm) to $\frac{1}{8}$ inch (3.0 mm) of free play at the end of the lever.



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2. Remove the inlet valve holder tool.
3. Put the diaphragm and cover in place, depressing the cover tightly to simulate a properly tightened clamp.
4. Depress the purge button in the center of the cover.





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